

PROCEEDINGS
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NEW SPECIES OF *CHRYSIS* IN THE *LAUTA*, *PROPRIA*
AND *VENUSTA* GROUPS FROM NORTH AMERICA
(HYMENOPTERA : CHRYSIDIDAE)

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The descriptions of new species and clarification of synonymy given below are offered to assist various biological research studies. Institutions which cooperated by furnishing material, and symbols used to designate them, are as follows: Academy of Natural Sciences, Philadelphia (ANSP); American Museum of Natural History (AMNH); California Academy of Sciences (CAS); California State Department of Agriculture (CSDA); Museum of Comparative Zoology, Harvard University (MCZ); Nevada State Department of Agriculture (NSDA); Purdue University (Purdue); University of Arizona (U. Ariz.); University of California at Berkeley (CIS); at Davis (UCD); at Riverside (UCR); University of Idaho (U. Idaho); University of Kansas (KU); Utah State University (USU); U.S. National Museum (USNM).

North American *Chrysis* divide into several well-defined species groups. Four of these were recently outlined (Bohart, R. M., 1962, "A review of the hexadentate species of *Chrysis* of America north of Mexico," *Acta Hymenopterologica* 1: 361-375). Undescribed species in two of these groups and some new synonymy are presented herein.

Illustrations were prepared by Miss Ellen Montgomery except for Figs. 11, 13, 14-25 which were drawn by Miss Judy Jay.

C. lauta group: Includes *coloradica* Bohart, *florissanticola* Rohwer, *lauta* Cresson, *tripartita* Aaron, *tularensis* Bohart, *vagabunda* Bohart and *xerophila* Bohart. Tergite III with 4 distinct teeth and a usually pronounced sublateral bow or in one species, *tularensis*, 6 distinct teeth; malar space less than 2.0 times mid-ocellus diameter (longest in *lauta* and *tripartita*); flagellomeres I-III in both sexes in descending order of length,

I about as long as II and III together (not in *vagabunda*), frontal carina absent or incomplete laterally, sometimes partially enclosing mid-ocellus, transverse area of upper frons often "braised"; ocelli not sunken nor lidded; gena narrow opposite propleuron; median crease of pronotum unusually sharp; mesopleuron not toothed; scutellum and postscutellum simple, rounded; apicolateral corner of tergite II obtuse; body hair pale to light fulvous, longest on vertex, beneath head and on legs.

Chrysis lauta Cresson

Chrysis lauta Cresson, 1865. Proc. Ent. Soc. Philadelphia 4: 311. Holotype female, Boulder, Colorado (ANSP).

Chrysis prasinus Cresson, 1865. Proc. Ent. Soc. Philadelphia 4: 310. Holotype male (not female), Colorado (ANSP). Preoccupied by *prasina* Klug, 1845.

Chrysis chlorophana Mocsáry, 1887. Termes. Fuzetek. 11: 16. New name for *prasinus*.

Chrysis clypeata Mocsáry, 1889. Monogr. Chrysid., p. 393. Holotype male, Chapultepec, Mexico (Vienna Museum). New synonymy.

Chrysis falsifica Buysson, 1891. Rev. Ent. (Caen) 10: 38. New name for *prasinus*.

The type of *prasinus* Cresson is a male rather than a female as originally recorded. It represents the other sex of *lauta*. Also, I have seen the holotype male of *clypeata* Mocsáry at the Natural History Museum in Vienna and it equals *lauta*. Several specimens from other parts of Mexico have been studied.

Characteristic of *lauta* are the long subantennal distance (about 2.5 times mid-ocellus diameter), the moderately long malar space (a little more than a mid-ocellus diameter), the relatively stout flagellomere I (less than twice as long as broad), and the very short teeth of tergite III.

I have seen material from NORTH CAROLINA: Southern Pines; GEORGIA: Lula, Vidalia; MISSISSIPPI: Oxford; TEXAS: Dalhart, Friona; KANSAS: Wallace County, Cheyenne County, Gray County; NEBRASKA: North Platte; COLORADO: Clear Creek County, Boulder, Fort Collins, Crook, Florissant, Fort Lupton; NEW MEXICO: San Jon, Loving, Rodeo; ARIZONA: Willcox; MORELOS (Mexico: 35 mi. S Cuernavaca); JALISCO (Mexico): Catatitlan, San Juan Lagos, Villa Hidalgo.

Chrysis coloradica Bohart, new name

Chrysis pulcherrima Cresson, 1865. Proc. Ent. Soc. Philadelphia 4: 311. Holotype male, Colorado (ANSP). Preoccupied by *pulcherrima* Lepeletier, 1806.

Diagnosis: About 7 mm long, blue-green to blue. Flagellomere I about as long as II and III together, basal five flagellomeres in male with much

long fine hair beneath, that under I longer than mid-ocellus diameter; least interocular distance in male about equal to length of flagellomeres I and II together; subantennal distance about 2.0 times mid-ocellus diameter, malar space about 1.0 times and interantennal distance about 0.6 times; no frontal carina (Fig. 6); teeth of tergite III short and blunt, pit row impressed, often partly confluent. Male sternite VIII subtriangular; gonostyle moderately stout, notched on inner edge (Fig. 17); digitus unusually broad, not finely pointed; aedeagus definitely flared subapically.

I have studied material from many Lower Sonoran to Hudsonian localities in California from San Bernardino County to Trinity County. Several specimens have been reared from nests of *Anthidium collectum* Huard by J. W. MacSwain from Antioch, California. Other distribution includes NEVADA: Verdi (M. E. Irwin, UCD); COLORADO (ANSP, USNM); and IDAHO: Craters of the Moon (R. M. Bohart, UCD).

Chrysis vagabunda Bohart, new species

Male: Length 8.0 mm. Green with slight blue and brassy tints (some paratypes extensively brassy); sternite II with a pair of large oval black spots; wings lightly stained in cellular area. Scapal basin nearly completely and densely covered with appressed silvery hair. Punctuation moderate, close, but with small intercalary punctures, especially numerous on tergite I; teeth of tergite III more sparsely punctate and with polished interspaces. Head broader than long; least interocular distance about equal to length of flagellomeres I–III combined; flagellomere I with no outstanding hair, about 1.5 times as long as broad and 0.65 times as long as II and III together; subantennal distance 1.3 times mid-ocellus diameter, malar space and interantennal space each 0.5 times; no frontal carina, frons a little grooved longitudinally below mid ocellus. Profile of tergite III strongly indented at pit row, latter deeply excavated with many confluent pits, middle of row curved forward very slightly at middle; teeth of tergite III short, dull, bracketing nearly equal and shallow emarginations, lateral edge of III a little bowed out beyond middle. Sternite VIII broadly cordate (Fig. 24); genitalia with moderately slender gonostyle which is entire along inner edge but has a clear spot (Fig. 25); digitus tapering to a fine point; aedeagus only a little flared subapically.

Female: About as in male. Scapal basin sparsely hairy, inner eye margins more nearly parallel.

Holotype male, Woodland, Yolo Co., California, 20 August 1953 (A. T. McClay, UCD). Paratypes, 32 males, 19 females, May to August, all from CALIFORNIA: Woodland (A. McClay, UCD, USNM), Davis (R. Bohart, R. James, UCD, USNM), Artois (M. Wasbauer, R. F. Smith, H. Hansen, J. MacSwain, CIS, UCD), Antioch (J. MacSwain, W. Barr, CIS, U. Idaho), Mt. Hamilton (E. Linsley, CIS); Tracy (J. MacSwain, P. Hurd, CIS), Stanislaus Co. (C. Moore, J. Grundel, UCD, CAS), Turlock (R. Snelling, CSDA), Plymouth (W. Simonds, CSDA), Tanbark

Flat in San Gabriel Mts. (P. Hurd, R. Bohart, CIS, UCD), La Crescenta (R. Bohart, UCD), Corona (CIS), near Fallbrook (J. A. G. Rehn *et al.*, ANSP). I have seen material also from OREGON: Corvallis; WASHINGTON: Yakima; NEVADA: Elko Co.; IDAHO: Notus, St. Anthony, Boise; and UTAH: Morgan Co.

The deeply impressed and largely confluent pit row together with the rather stout flagellomere I which is practically hairless in the male, the short malar space, and the moderate subantennal distance characterize the species. It appears most closely related to *lauta* which has a longer subantennal distance (2.5 times mid-ocellus diameter), a slightly longer flagellomere I, a more triangular male sternite VIII, and a more slender male gonostyle. Specimens from outside California tend to be more blue than green but agree in structural details. A few females have traces of a flattened carina curved toward the mid ocellus.

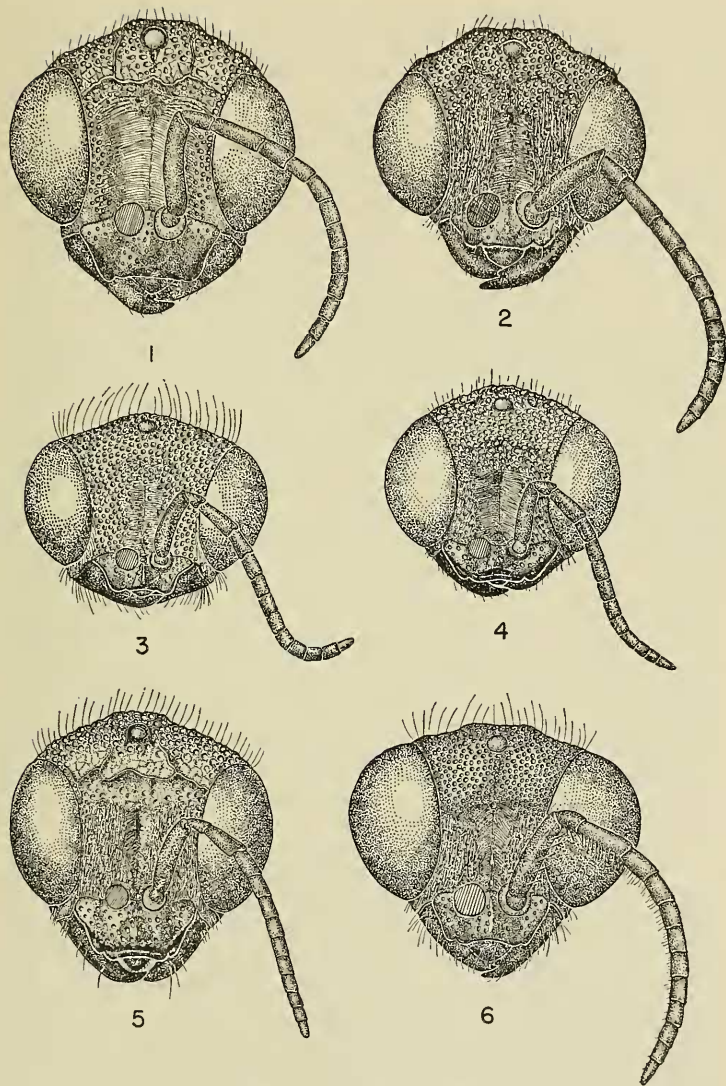
***Chrysis xerophila* Bohart, new species**

Male: Length 7.5 mm. Green and blue mixed, a few brassy tints (more extensive in some paratypes), sternite II with a nearly touching pair of weakly defined dark spots; wings lightly stained. Scapal basin with fairly abundant erect hair only. Punctuation moderate, close, slightly confluent on notum, fairly coarse on tergite III but considerable smooth areas present on teeth. Head broader than long, least interocular distance about equal to length of flagellomeres I–III combined (Fig. 3); flagellomere I with no outstanding hair, about 2.0 times as long as broad and as long as II and III together; subantennal distance 1.2 times diameter of mid ocellus, malar space and interantennal space each about 0.7 times; no frontal carina, a broad valley below mid ocellus; profile of tergite III a little humped at middle, slightly indented at weak and irregular pit row; teeth short, blunt, emarginations subequal and shallow, lateral edge of tergite III gently bisinuate. Sternite VIII shield-like (Fig. 20); genitalia with an obtusely indented gonostyle which has the ventral "sac" coarsely spiculate at outer base (Fig. 21); digitus tapering to a fine point; aedeagus flared subapically and with a long oval clear spot in widest area.

Female: About as in male.

Holotype male, Borrego Valley, San Diego Co., California, 19 April 1957 (R. M. Bohart, UCD). Paratypes, 8 males, 10 females, 30 March to 17 July from CALIFORNIA: Borrego Valley (M. Wasbauer, CSDA, USNM; R. W. Bushing, UCD; R. M. Bohart, UCD; H. R. Moffitt, UCD, CAS); Jacumba (R. H. Beamer, KU); Mojave Desert (N. F. Hardman, UCD); Short Canyon near Inyokern (J. W. MacSwain, CIS); Hungry Valley near Gorman (J. Powell, CIS); Mazourka Canyon, Inyo Co. (J. W. MacSwain, CIS).

The subantennal distance is shorter than in most species of the group, being hardly twice as long as the malar space and one-half as long as flagellomere I. The nearest relative seems to be *florissanticola* Rohwer



FIGS. 1-6. Male *Chrysis*, front view of head. 1, *C. vibex* Bohart; 2, *C. tensa* Bohart; 3, *C. xerophila* Bohart; 4, *C. rivalis* Bohart; 5, *C. crotrema* Bohart; 6, *C. coloradica* Bohart. Figs. 1-5 are of holotypes.

which has an even weaker pit row and the male has much densely appressed hair on the scapal basin. Also, the subantennal distance in *florissanticola* is about two-thirds as long as flagellomere I.

C. propria group: Includes *propria* Aaron, *aridula* Bohart, *submontana* Rohwer, *crotema* Bohart, *prolata* Bohart, *rivalis* Bohart, *tensa* Bohart and *vibex* Bohart. Tergite III 4-toothed and bowed out laterally, in extreme cases angled (*tensa*) or forming a third pair of teeth (*aridula*); malar space less than subantennal distance, usually about 0.5 times mid-ocellus diameter; flagellomeres I-III in both sexes in descending order of length, I at least twice as long as broad; frontal carina weak or irregular, broken or depressed medially, often with dorsal extensions partially enclosing mid ocellus which is thus lidded (not in *rivalis*); posterior ocelli slightly lidded (not in *rivalis*); gena very narrow opposite propleuron; mesopleuron somewhat rough, carinae irregular, subdentate; scutellum and postscutellum simple, rounded; tergite II but not III usually with very faint indications of a median longitudinal raised area; apicolateral corner of tergite II obtusely angled; body hair generally pale, erect, longest on vertex, beneath head, and on legs; male genitalia with gonostyle distally stout (not in *crotema*) and bearing a long hair fringe; sternite VIII stout, subtriangular (shield-like in *crotema*).

***Chrysis crotema* Bohart, new species**

Male: Length 7.0 mm. Blue with greenish and purplish tints, sternite II with a pair of irregular dark spots; wings lightly stained in cellular area. Scapal basin on lateral two-fifths with rather short but dense and appressed silvery hair. Punctuation moderate, close, mostly of one size but with many small intercalary punctures; scapal basin almost completely covered with close fine punctuation; middle of postscutellum with unusually coarse punctures; teeth of tergite III closely punctate. Head about as long as broad (Fig. 5); flagellomere I about four-fifths as long as II and III together; subantennal distance about 3.0 times mid-ocellus diameter; interantennal distance about 0.7 times; frontal carina wavy but strong, subtended by weak branches which enclose mid ocellus, latter strongly lidded, all ocelli somewhat sunken, interocular area above transverse carina and below mid ocellus somewhat transversely areolate; tergite III indented at pit row in profile, a perceptible median hump in front of pit row, pits moderate in size, about 14 in number, some partly confluent, mid carina somewhat depressed; teeth moderate, sharp, a little deflected, thickened beneath and bicarinate, median notch deeper than submedian ones, lateral edge of tergite III well rounded out. Sternite VIII peculiarly shield-shaped (Fig. 18); genitalia with gonostyle finger-shaped distally, with long terminal bristles (Fig. 19); digitus slender, saw-like.

Female: About as in male but more green than blue; as much of scapal basin obliquely striate as punctate; hair of scapal basin less prominent.

Holotype male, Rodeo, Hidalgo Co., New Mexico, 23 August 1958 (R. M. Bohart, UCD). Paratypes, 6 males, 4 females, July to September,

as follows: ARIZONA: near Portal (M. Statham, C. and M. Cazier, AMNH; P. D. Hurd, CIS), Apache (W. W. Jones, USNM); NEW MEXICO: Rodeo (P. D. Hurd, CIS); MEXICO: near Fresnillo, Zacatecas (E. G. Linsley *et al.*, CIS).

The unusually long subantennal distance, which is about five times the malar space, distinguishes *crotema* from others in the group except *prolata*. The latter has tergite III evenly convex in profile, the pits not in a furrow, and no hump before the pit row. The oddly shaped male sternite VIII of *crotema* is distinctive, but since males of *prolata* are unknown, a comparison is not possible.

Chrysis prolata Bohart, new species

Female: Length 6.5 mm. Blue with green and some purple tints, sternite II with a pair of nearly touching oval black spots, wings lightly stained. Scapal basin sparsely haired laterally. Punctuation moderate, close, mostly of one size but with numerous small intercalary punctures, teeth of tergite III closely punctate. Head broader than long, appearing "pinched" below eyes in front view; flagellomere I nearly as long as II and III together; subantennal distance about 3.0 mid-ocellus diameters; ocelli somewhat sunken and lidded, mid ocellus nearly enclosed by dorsal branches of frontal carina, latter somewhat fragmentary; tergite III slightly and evenly convex in profile, pits discrete, lodged in a barely perceptible furrow, two most median pairs round, median notch deeper than submedian ones but rounded, teeth thickened and bicarinate beneath; tergite III strongly rounded out laterally, median pair of teeth a little rounded distally.

Holotype female, Riley Co., Kansas (UCD). Paratype female, Washington Co., Wisconsin (S. Graenicher, MCZ).

The only other species of the group with unusually long subantennal distance is *crotema* which has a deeply excavated pit row and a median hump just preceding it.

Chrysis rivalis Bohart, new species

Male: Length 7.5 mm. Blue with green and purple tints, pleuron extensively greenish; sternite II with a black subbasal band; wings nearly clear. Lateral one-fourth of lower scapal basin with moderate, partially appressed silvery hair. Punctuation moderate, close, unusually fine and close on tergites II-III, coarser toward base of tergite I where two puncture sizes are evident, even coarser on thorax. Head broader than long (Fig. 4); flagellomere I slightly shorter than II and III together (as long as II and III in some paratypes); subantennal distance 1.5 times diameter of mid ocellus; ocelli not unusually sunken, not lidded, frontal carina very weak, most evident medially, dorsal branches faint; tergite II with a weak longitudinal median ridge on basal two-thirds; tergite III in profile a little humped before pit row, latter weakly indented and containing 10 well-formed but small pits, as well as some smaller and more basal ones; teeth of tergite III rather weak and blunt, not much curved

downward, median notch acute, submedian one shallow; lateral edge of tergite III a little biconvex. Sternite VIII broadly subtriangular (Fig. 22); genitalia with a short, broad gonostyle which is curved outward distally and hairy along inner distal margin (Fig. 23), digitus broadly blade-like.

Female: About as in male. Lateral edge of tergite III only a little convex. Color greenish blue to bluish green.

Holotype male, Samuel Springs (now southeast edge of Berryessa Lake), Napa Co., California, 13 May 1956 (S. M. Fidel, UCD). Paratypes, 40 males, 104 females, April to August, from CALIFORNIA: Samuel Springs, Napa Co. (R. Bohart, J. Hall, J. Downey, E. Schlinger, S. Fidel, R. Bechtel, UCD); Tanbark Flat, San Gabriel Mts., Los Angeles Co. (T. Haig, P. Hurd, R. Bohart, J. Linsley, W. Bentinck, J. Hall, B. Bartosh, H. Mathis, S. Miyagawa, A. McClay, M. Stebbins, C. Wiley, R. Schuster, J. MacSwain, H. Hansen, H. Michalk, F. Williams, UCD, CIS, CAS, CSDA); Arroyo Seco, Monterey Co. (P. Torchio, R. Bohart, Don Burdick, CIS, UCD). Mt. Diablo, Contra Costa Co. (J. MacSwain, P. Hurd, J. Rozen, CIS); Mt. Hamilton, Santa Clara Co. (D. Burdick, J. MacSwain); near New Idria, San Benito Co. (J. MacSwain, CIS). Paratypes distributed also to other institutions listed in the introduction as well as to R. R. Dreisbach, W. Linsenmaier and S. Zimmermann.

Other material has been examined from many Upper Sonoran localities in California as well as from OREGON: Harney Co.; IDAHO: Mt. Home, Dixie, Giveout; WYOMING: Jackson Hole; UTAH: Salt Lake Co.; COLORADO: Steamboat Springs; and NEVADA: Emigrant Pass and Paradise Valley.

The fine and very dense punctation of tergites II and III together with the short blunt teeth of tergite III and the hardly developed frontal carina will distinguish *rivalis* from other species in the group. The male genitalia are short, broad, and appear distorted because of the outwardly flared gonostyles.

***Chrysis tensa* Bohart, new species**

Male: Length 7.0 mm. Green with bluish and some brassy tints, legs and pleuron mostly blue, sternite II with a pair of oval black spots angled inward and backward; wings nearly clear. Scapal basin on lateral one-third with dense appressed silvery hair. Punctation moderate, close, mostly of one size but with many small intercalary punctures, teeth of tergite III closely striatopunctate. Head broader than long (Fig. 2); flagellomere I about three-fourths as long as II and III together; subantennal distance about equal to diameter of mid ocellus; ocelli somewhat sunken, lidded, mid ocellus enclosed by broken extensions from frontal carina which bound a depressed striatopunctate area; tergite III slightly and evenly convex in profile, pits discrete, not in a furrow, two most median pairs round, notch between median pair of teeth broadened and doubly carinate; tergite III strongly angled out laterally, teeth long

and sharp. Sternite VIII as in Fig. 14; genitalia with broadly rounded gonostyle (Fig. 15), digitus narrow and curved.

Female: About as in male. Malar space even narrower; tergite III with lateral lobe strongly rounded but less so than in male; flagellomere I nearly as long as II and III together.

Holotype male, 15 miles north of Yuma, Arizona, 4 April 1963 (F. D. Parker, UCD). Paratypes, 18 males, 9 females, April to August, as follows: CALIFORNIA: Brawley (G. Bohart, USU); ARIZONA: Phoenix (R. Kunze, Purdue), Willcox (A. D. Telford, UCD), Kansas Settlement (G. D. Butler, U. Ariz.) Tempe (J. Bequaert, MCZ); Mustang Mt. (E. Beamer, KU), Amado (G. Butler, U. Ariz.), near Portal (C. and M. Cazier, AMNH); UTAH: River Heights (S. L. Wood, USNM); NEW MEXICO: Rodeo (E. G. Linsley, CIS), Granite Pass, Hidalgo Co. (P. D. Hurd, CIS); Pedernal (E. L. Kessel, CAS), Fort Sumner (E. L. Kessel, CAS), Torrance Co. (C. H. Martin, KU), Moriarty (L. H. Banker, KU); TEXAS: near Marathon (R. F. Smith, AMNH), Presidio (E. R. Tinkham, UCD), Catarina (C. Michener *et al.*, KU); Mexico: near Alamos, Sonora (M. Cazier *et al.*, AMNH); Matachic, Chihuahua (C. Michener, AMNH).

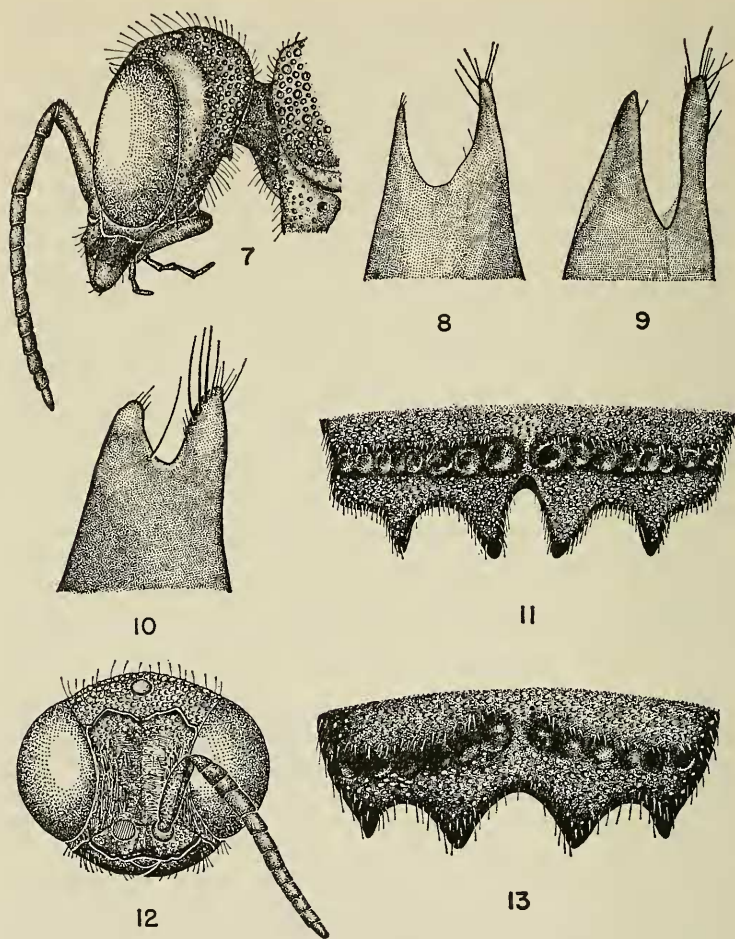
The strongly developed lateral lobe of tergite III is practically diagnostic in the group. The smoothly convex profile of tergite III and the discrete pits are characteristics shared with *prolata*, *aridula* and some specimens of *propria*. Some of the paratypes are more blue than green.

Chrysis vibex Bohart, new species

Male: Length 7.5 mm. Dark green with some blue and brassy reflections, sternite II with a pair of large transverse spots; wings moderately stained in cellular area. Scapal basin with scant semi-erect silvery hair on lateral one-third. Punctuation moderate, close, mostly of one size but with many small intercalary punctures, teeth of tergite III punctate and a little striate. Head about as long as broad (Fig. 1); flagellomere I as long as II and III together, subantennal distance about 2.0 times mid-ocellus diameter, interantennal distance about 0.7 times, frontal carina irregular, divided medially by a groove extending from mid ocellus to near middle of scapal basin, a subocellar area bounded laterally by carinae but mostly open above, ocelli slightly lidded, hind ocelli somewhat sunken, a large smooth shiny, kidney-shaped spot behind and adjacent to compound eye (Fig. 7); tergite III indented at pit row in profile; pits moderate in size, about 16 in number, some partly confluent, mid carina narrow but only a little depressed; teeth moderate, sharp, thickened beneath and bicarinate, median notch narrower and more angled than submedian, lateral edge of tergite III strongly bowed out (Fig. 11). Sternite VIII broadly subtriangular; genitalia with gonostyle broad and distally fringed (Fig. 16), digitus stoutly blade-like.

Female: About as in male, teeth of tergite III a little more blunt.

Holotype male, Portal, Cochise Co., Arizona, 12 August 1958 (R. M.



FIGS. 7-13. Male *Chrysis*. 7, *C. vibex* Bohart, side view of head and prothorax; 8-10, distal one-half of gonostyle; 8, *C. austria* Bohart; 9, *C. venustella* Bohart; 10, *C. venusta* Cresson; 11, *C. vibex* Bohart, apex of tergite III; 12, *C. venustella*, front view of head; 13, *C. austria* Bohart, apex of tergite III. Figs. 7, 11-13 are of holotypes.

Bohart, UCD). Paratypes, 29 males, 18 females, April to September, as follows: ARIZONA: Santa Rita Mts. (R. M. Bohart, UCD; R. H. Beamer *et al.*, KU), near Portal (M. Statham, C. and M. Cazier, AMNH), near Apache (E. G. Linsley, P. D. Hurd, CIS), east of Douglas (W. F. Barr, U. Idaho; M. A. Cazier, CIS; R. M. Bohart, UCD), Patagonia (J.

Bequaert, MCZ, U. Ariz.); NEW MEXICO: 18 miles north of Rodeo (P. M. Marsh, CIS); TEXAS: Alpine (E. C. Van Dyke, CAS; L. D. Beamer, KU), Fort Davis (E. C. Van Dyke, CAS), near Marathon (R. F. Smith, AMNH). In addition to above institutions, paratypes distributed also to USNM, ANSP, Purdue, W. Linsenmaier and S. Zimmermann. Metatypes, 1 male, Guadalajara, Jalisco, Mexico (P. D. Hurd, CIS), 1 male, 25 miles south of Chihuahua, Chihuahua, Mexico (P. D. Hurd); 1 female, El Alamo, Nuevo Leon, Mexico (M. Leonardo, UCD). 1 male, 2 females, 4 miles west of Quincy, California (J. E. Gillaspay, CIS; E. I. Schlinger and R. C. Bechtel, UCD).

The smooth postocular spot (Fig. 7) readily separates *vibex* from the other species in the group with even longer subantennal distance, *crotema* and *prolata*. The metatypes from Quincy have only a small postocular smooth spot but are typical in other respects.

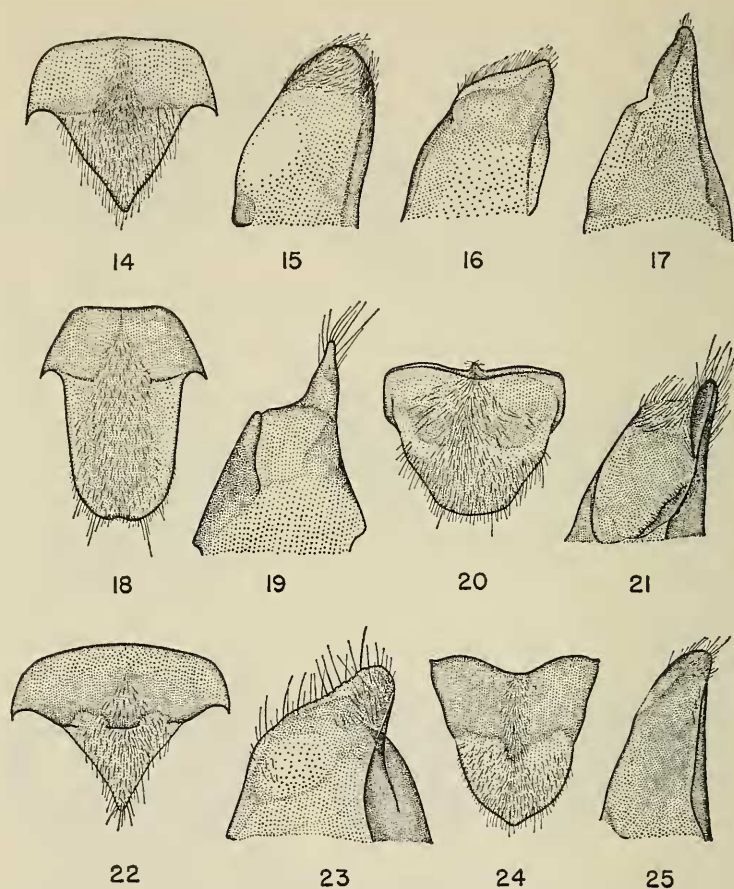
C. venusta group: Includes *venusta* Cresson, *astralia* Bohart and *venustella* Bohart. Tergite III with 4 distinct teeth, median pair strongest, teeth double-edged beneath; pit row rather deep, pits mostly large and often confluent, most median part of row expanded somewhat anteriorly; malar space about as long as or shorter than diameter of mid ocellus, in any case shorter than subantennal distance which is somewhat greater than mid-ocellus diameter; flagellomeres of male with I about as long as pedicel, II shorter, III nearly twice as long as I, IV a little shorter than III; flagellomeres of female with I about 1.7 times as long as broad, II to IV subequal and each about 0.6 times as long as I; frontal carina very broadly M-shaped, continued downward along inner eye margins; ocelli not especially sunken nor lidded; mesopleuron without distinct teeth; scutellum and postscutellum simple, rounded; tergites II-III with a faint longitudinal median raised or smooth line; male genitalia with gonostyle sharply excavated distally.

Chrysis astralia Bohart, new species

Male: Agreeing with description of *venustella* except as follows: teeth of tergite III with well spaced punctures above median emargination; median carina of pit row a little broadened, smooth, not depressed (Fig. 13); tergite III nearly evenly convex in profile. Sternite VIII with subtriangular basal part and a slender "tail"; genitalia with outer arm of forked apex of gonostyle subtriangular (Fig. 8), proportionately intermediate in length between that of *venusta* and that of *venustella* (Figs. 9, 10).

Female: About as in male. Body sometimes bluish, flagellomere I green above; frontal hair bands less thick; teeth of tergite III shorter, lateral pair obtuse.

Holotype male, Davis, Yolo Co., California, 26 August 1956 (A. T. McClay, UCD). Paratypes, 58 males, 42 females, May to September, from CALIFORNIA as follows: Trabuco Canyon, Orange Co.; Twentynine Palms (M. Boyer); Wasco (J. Powell); Buttonwillow (P. A. Opler);



FIGS. 14-25. Male *Chrysis*. 14, 18, 20, 22, 24, sternite VIII; 15-17, 19, 21, 23, 25, distal one-half of gonostyle, ventral; 14-15, *C. tensa* Bohart; 16, *C. vibex* Bohart; 17, *C. coloradica* Bohart; 18-19, *C. crotema* Bohart; 20-21, *C. xerophila* Bohart; 22-23, *C. rivalis* Bohart; 24-25, *C. vagabunda* Bohart. All Figs. except 17 are of holotypes.

Wood Lake, Tulare Co. (N. W. Frazier); Willow Slough, Madera Co. (R. W. Thorp); Helm (H. Michalk); Ceres (W. W. Middlekauff); Dos Palos (C. A. Hanson); Tracy (P. D. Hurd, J. W. MacSwain); Antioch (E. C. Van Dyke); Davis (A. T. McClay); Elkhorn Ferry, Yolo Co. (R. Bohart); Woodland (A. T. McClay); Artois (H. L. Hansen, J. W. MacSwain). Paratypes returned to or deposited in all of the institutions listed in the introduction; also to R. R. Dreisbach, W. Linsenmaier and

S. Zimmermann. Metatypes: 7 males, 2 females, White Sands, NEW MEXICO (R. H. Beamer, KU); Wilna, New Mexico (J. Rehn, Sr., *et al.*, ANSP); Watson, UTAH (F. M. Carpenter, MCZ); Hiko, NEVADA (F. D. Parker, NSDA); near Douglas, ARIZONA (M. A. Cazier, AMNH); Pescadero, Baja California, MEXICO (Ross and G. Bohart, CAS); near Sombrete, Zacatecas, Mexico (P. D. Hurd, CIS).

The moderately incised gonostyle of *astralia*, intermediate between those of *venusta* and *venustella* (Figs. 8-10) is the single most diagnostic feature. The short malar space will separate the species from *venusta*, and the stout, smooth, median carina of the pit row contrasts with that of *venustella*. Since male genitalia are so critical in this group, I have dissected all specimens studied. Among these are a group from Hallelujah Junction, Lassen Co., California and one male from Orovida, Nevada which agree in genitalic characters with *astralia* but have several distinctive features such as longer and more densely punctate teeth on tergite III, sharper mid-carina of the pit row, and blue to purple body color. For the present I regard them as atypical *astralia*.

Chrysis venustella Bohart, new species

Male: Length 7.5 mm. Green with bluish and some brassy tints, sternite II with a pair of oval black spots which are enlarged laterally; wings lightly stained in cellular area. Scapal basin on lateral one-third densely clothed with appressed silvery hair, other body hair erect and pale fulvous. Punctuation moderate, close, mostly of one size, numerous smaller punctures between larger ones on tergite II, teeth of tergite III closely punctate. Head broader than long (Fig. 12); eye a little narrower than least interocular distance in front view, malar space about 0.5 times mid-ocellus diameter and 0.4 times subantennal distance; apico-lateral corner of tergite II obtusely angled; tergite III in profile convex before pit row, depressed there and humped distally, the teeth acute, curving downward; mid carina of pit row thin, depressed, punctate posteriorly; lateral margin of tergite undulate and a little concave overall. Sternite VIII with a subtriangular basal part and a moderately slender "tail"; genitalia with outer arm of forked apex of gonostyle a long, nearly cylindrical club (Fig. 9).

Female: About as in male. Green with bluish tints or vice versa; flagellomere I green or blue-green above; frons with hair bands but less prominent than in male; teeth of tergite III shorter, lateral pair obtuse; median carina of pit row sharply edged and depressed.

Holotype male, Davis, Yolo Co., California, 2 May 1959 (F. D. Parker, UCD). Paratypes, 27 males, 30 females, May to September, from CALIFORNIA as follows: Warner Springs (R. Bohart); Peters Canyon (R. Bohart); Tanbark Flat, Los Angeles Co. (R. Bohart); La Crescenta (C. D. Michener); Greenhorn Mountains (J. Bequaert); Watts Valley, Fresno Co. (R. O. Schuster); Arroyo Seco Camp, Monterey Co. (R. Bohart); San Antonio Valley, Santa Clara Co. (J. E. Gillaspay); Mt.

Hamilton (J. W. MacSwain); Mariposa (R. Bohart); Topaz Lake (E. L. Brazil); Boca, Nevada Co. (M. E. Irwin); Sierraville (R. Bohart); Tracy (P. D. Hurd, J. W. MacSwain); Tesla, Alameda Co. (P. D. Hurd); Walnut Creek (J. A. Chemsak, J. F. Lawrence); Mt. Diablo (J. W. MacSwain); Davis (F. D. Parker, B. M. Bartosh, E. I. Schlinger); Woodland (A. T. McClay); Carmichael (T. Gantenbein); Samuel Springs, Napa Co. (S. M. Fidel, E. I. Schlinger); Manton (R. Bohart); Santa Rosa (K. Frick); Orland (R. F. Smith); Artois (H. R. Hansen, J. W. MacSwain); Blocksburg (H. J. Rayner); from NEVADA as follows: Paradise Valley, Humboldt Co. (F. D. Parker). Paratypes returned to or deposited in all of the institutions listed in the introduction; also to R. R. Dreisbach, W. Linsenmaier and S. Zimmermann. Metatypes: 3 females, Yakima River (MCZ); 1 female, Sparks, Nevada (F. D. Parker, UCD).

The three closely related species of the *venusta* group are best determined by reference to male genitalia (Figs. 8-10). In addition the narrow malar space (broadest in *venusta* Cresson where it usually exceeds a mid-ocellus diameter), sharply edged and sunken mid carina of the pit row, and the closely punctate distal teeth of tergite III will, when taken together serve to distinguish *venustella*.